

Upper surface of the body with longitudinal buff- and brown-olive streaks; the under surface white, with a tawny line running along the middle of the abdomen.

Exp. 57 millim.

Hab. Simbang, near Finschhafen, German New Guinea (*Micholitz*, June 1893).

Named in honour of the collector.

LXVI.—*On a Small Collection of Lepidoptera from Chili.*

By ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S., &c.

A SHORT time since Herr G. Ruschewegh, of Buenos Aires, wrote to ask whether I would undertake to determine a series of Chilian Geometræ, conditionally on the specimens being presented to the British Museum; to this I agreed, and during September a box of Lepidoptera in papers came to hand, some of which, indeed, are not Geometræ and several of which, when set up, I found to be in such bad condition as to be unrecognizable. The latter are numbered respectively as follows:—Deltoids (nos. 12, 78, and 120), Geometræ (nos. 17, 61, 63 in fragments, 111, 137, and 147), these nine examples being all worn, rubbed, and more or less broken. Herr Ruschewegh forwarded with the specimens a letter, in which he proposed a number of names for the new species, the majority of which are, however, so unclassical in character that it would not be possible to employ them. The following is a catalogue of all the recognizable species:—

Hepialidæ.

1. *Dalaca subfervens*, Butler.

Dalaca subfervens, Butler, Trans. Ent. Soc. 1882, p. 25. n. 39.

In my account of the Bombyces of Chili I recognized six species of *Dalaca*, five of which Mr. Hampson has since put together under the name of *D. pallens*, Blanch.: breeding alone will decide whether he is right in so doing; at present, judging from the extraordinary variability of many of the Chilian Lepidoptera, it is quite as possible as it is at present unproved.

NOCTUÆ.

2. *Peridroma saucia*, Hübner.

Peridroma saucia, Hübner, Samml. eur. Schmett., Noct. fig. 378.

The examples are links between typical *P. saucia* and *P. hostilis* and are labelled D, F, H, and C 6 respectively.

3. *Leucania impuncta*, Guenée.

Leucania impuncta, Guenée, Noct. i. p. 83. n. 117 (1852).

Labelled "E, F. *Oxyacanthæ*."

4. *Leucania unipuncta*, Haworth, var. *separata*, Walker.

Leucania unipuncta, Haworth, var. *separata*, Walker, Lep. Het. xxxii. p. 626 (1865).

Labelled G 3.

5. *Plusia gammoides*, Blanchard.

Plusia gammoides, Blanchard, in Gay's Fauna Chilena, vii. p. 84. n. 1, pl. vi. fig. 11 (1854).

Labelled A.

6. *Plusia chilensis*, Butler.

Plusia chilensis, Butler, Trans. Ent. Soc. 1882, p. 138. n. 43.

Labelled B.

As already noted, the Deltoid Noctuæ are in too poor condition for recognition.

The remainder of the collection consists wholly of Geometræ. I have followed Mr. Warren's recent arrangement of this group.

G E O M E T R Æ.

7. *Psilaspilates cavifusciata*, Butler.

Panagra cavifusciata, Butler, Trans. Ent. Soc. 1882, p. 384. n. 65.

Numbered 55.

8. *Psilaspilates ceres*, var., Butler.

Lozogramma ceres, var., Butler, Trans. Ent. Soc. 1882, p. 383. n. 63.

Numbered 66.

9. *Psilaspilates venata*, Butler.

Liodes venata, Butler, Trans. Ent. Soc. 1882, p. 382. n. 62.

Numbered 151.

It will be seen that Mr. Warren has associated together under a new genus of his own three species which I regarded as belonging to different recognized genera; it is possible that, in spite of their different aspect, they may be strictly congeneric; it is also not improbable that the genera to which I assigned them may not differ in essential characters, but at

present I cannot spare time to examine into this point critically. As regards *Panagra*, it is certain that Walker associated together several very distinct genera under one name.

10. *Pharmacis mixta*, Butler.

Pharmacis mixta, Butler, Trans. Ent. Soc. 1882, p. 375. n. 52.

Labelled No. 96.

Var. *seriata*, Butler.

Pharmacis mixta, var. *seriata*, Butler, *l. c.*

Labelled Nos. 97-99.

11. *Pharmacis latifasciata*, Butler.

Pharmacis latifasciata, Butler, Trans. Ent. Soc. 1882, p. 377. n. 54.

Labelled No. 77.

12. *Heterophleps ophiusina*, var., Butler.

Heterophleps ophiusina, var., Butler, Trans. Ent. Soc. 1882, p. 423. n. 133.

Nos. 4, 134, and 155.

13. *Neorumia lutea* and *gracilis*, Bartlett-Calvert.

Neorumia lutea and *gracilis*, Bartlett-Calvert, Trans. Ent. Soc. 1893, pp. 216, 217.

N. lutea, typical. Nos. 86 and 87.

N. gracilis. No. 88. This is only a suffused variety of *N. lutea*.

14. *Anisogonia deustata*, var. *carnea*, Butler.

Paragonia deustata, var. *carnea*, Butler, Trans. Ent. Soc. 1882, p. 353.

♂ ♀. Nos. 43, 44, 81, and 113.

Var. *rosea*, Butler.

Paragonia deustata, var. *rosea*, Butler, *l. c.* p. 354.

♂ ♀. Nos. 10, 27, 41, 45, 49, 59, 64.

Var. typ. *deustata*, Felder.

Paragonia deustata, var. typ., Felder, Reise der Nov., Lep. v. pl. exxiv. fig. 8 (1875).

♂. No. 18.

Var. *cinerea*, Butler.

Paragonia deustata, var. *cinerea*, Butler, *l. c.* p. 354. n. 22.

♂ ♀. Nos. 51, 96, 106.

Since I separated the forms of this species so many new and intermediate types have come to hand that I am forced to the conclusion that the whole are sports of one extremely variable species.

15. *Syncirsodes valdiviana*, Butler.

Apicia valdiviana, Butler, Trans. Ent. Soc. 1882, p. 342. n. 5.

♂ ♀. Nos. 15 and 16.

The female is larger than the male (48 millim.) and the ground-colour above is of a slightly greenish-cream tint; otherwise it resembles the male; the males, however, vary somewhat in the colouring of the upper surface; it is therefore possible that females having the upper surface-colouring of the typical male may occur.

16. *Euangerona valdiviæ*, Butler.

Euangerona valdiviæ, Butler, Trans. Ent. Soc. 1882, p. 359. n. 29.

Seven examples (numbered respectively 82, 83, 84, 91, 105, 108, 155), showing somewhat similar variations to those occurring in *Angerona prunaria*, but duller throughout.

17. *Odontothera virescens*, Butler.

Odontothera virescens, Butler, Trans. Ent. Soc. 1882, p. 409. n. 105.

No. 112.

18. *Odontothera debilis*, Butler.

Odontothera debilis, Butler, Trans. Ent. Soc. 1882, p. 410. n. 106.

♂. No. 95. The primaries greener and the secondaries greyer than the type of the female.

19. *Digonis aspersa*, Butler.

Digonis aspersa, Butler, Trans. Ent. Soc. 1882, p. 361. n. 31.

No. 13.

20. *Microclysia Philippii*, Bartlett-Calvert.

Microclysia Philippii, Bartlett-Calvert, Trans. Ent. Soc. 1893, p. 200.

No. 75.

21. *Mæandrogonaria* (Warren) *valentina*, sp. n.

Primaries with the basal third ferruginous; a short white oblique line immediately followed by a quadrate spot on the costa; central area bounded and crossed by three oblique dark lines, angulated towards costa, equidistant on inner margin;

the two inner ones rufous brown, enclosing a white belt striated with ferruginous, and divided by rufous-brown veins; the third line slaty grey; the interval between the second and third lines also white, similarly interrupted to the belt already mentioned, but interrupted below the subcostal vein by a patch of greyish coffee-brown; the costal extremities of all three lines commencing in oblique quadrate ferruginous spots, separated by similarly shaped white spots, one of which also follows the third line; external third coffee-reddish, slightly suffused with greyish and sericeous; an almost triangular patch of white, striated with fine lines of the ground-colour, tapering from costa; fringe interrupted by lunate white spots; secondaries sericeous white, traversed from about the middle of abdominal margin by two subparallel well separated grey lines, which become indistinct and are angulated towards costa; the inner line less defined than the outer; abdominal and external areas suffused with rosy coffee-brown, darkest at anal angle; fringe rufous brown, interrupted by white lunules: body ferruginous, the abdomen sericeous and paler than the thorax. Wings below paler than above, with the markings more sharply defined; the apical patch and costa of the primaries ochreous; the basal area whitish; the secondaries almost like the primaries in character, sparsely striated with ferruginous: the frons and palpi deep ferruginous; the body whitish, densely irrorated with ferruginous at the sides; the legs white, clouded with ferruginous externally and regularly spotted with dark rufous brown. Expanse of wings 35 millim.

No. 140.

The form of this species corresponds with that of my *Azelina corticalis*, but the pattern and colouring are unique.

22. *Perusia precisaria*, Herrich-Schäffer.

Perusia precisaria, Herrich-Schäffer, Auss. Schmett. fig. 415.

♂ ♀. Nos. 1 and 2.

23. *Casbia lapidea*, Butler.

Tephрина lapidea, Butler, Trans. Ent. Soc. 1882, p. 378. n. 56.

No. 3. I think this insect would have been better left in *Tephрина* than in *Casbia*; but it is more convenient for purposes of reference to follow Warren's arrangement.

24. *Scordylia vittata*, Philippi.

Euclida vittata, Philippi, Linnæa Entom. xiv. p. 295. n. 32 (1860).

No. 133. I cannot follow Warren in calling this genus

Heterusia until it has been decided, first, that *Devanica*, Moore, shall supersede *Eterusia* (*sic*) of Hope; and, second, that the species of *Scordylia* are congeneric with the very dissimilar species figured by Hübner as the type of his genus. Mr. Warren appears to have followed Felder in adopting *Heterusia*, Hübner, for the species of *Scordylia*.

25. *Eucosmia exacta*, Butler.

Scotosia exacta, Butler, Trans. Ent. Soc. 1882, p. 415. n. 114.

No. 8.

26. *Anchiphyllia* (Warren) *olivacea*, Butler.

Sarracena olivacea, Butler, Trans. Ent. Soc. 1882, p. 421. n. 129.

No. 30. Warren associates under one name *S. olivacea*, *pellicata*, and *declinata*, ignoring marked differences in form of wing and pattern. Of course this is a purely arbitrary decision, not supported by a particle of evidence. Although it is possible that the three types may eventually prove to be seasonal forms or alternating generations of a single species, it is, to say the least, not usual for three types of wing-outline combined with three types of wing-banding to occur in one species; therefore, until their identity has been proved or disproved by breeding, I shall not bow to Mr. Warren's decision.

27. *Phyllia triangularia*, Blanchard.

Phyllia triangularia, Blanchard, in Gay's Fauna Chilena, vii. p. 89. n. 1, pl. vii. fig. 5 (1852-54).

Nos. 9, 23, and 116. Varying slightly in tint; my *P. cinereus* is probably a well-defined variety of the same.

28. *Chlorotimandra viridis*, Butler.

Chlorotimandra viridis, Butler, Trans. Ent. Soc. 1882, p. 369. n. 45.

♂ ♀. Nos. 57 and 62.

29. *Rhopalodes virescens*, Philippi.

Tomopteryx virescens, Philippi, Stett. ent. Zeit. xxxiv. p. 315. n. 3, pl. ii. fig. 7 (1873).

♂. No. 78.

Warren placed this under two genera, believing probably that I had wrongly identified Philippi's species; now that we have the male, it is perfectly evident that my identification was correct.

30. *Tomopteryx læta*, Philippi.

Tomopteryx læta, Philippi, Stett. ent. Zeit. xxxiv. p. 314. n. 2, pl. ii. fig. 6 a (1873).

♀. No. 36.

The female is larger than the male and has the well-developed secondaries of all females of the family.

31. *Tomopteryx esmeralda?*, Bartlett-Calvert.

? *Rhopalodes esmeralda*, Bartlett-Calvert, Trans. Ent. Soc. 1893, p. 218.

No. 31.

I have not been able to find any specimen in the collection answering to the description and believe it cannot have been forwarded with Mr. Bartlett-Calvert's other species; the specimens before me are not in good condition, but probably represent the species, the only additional character being a small triangular white spot at the end of the cell of primaries with a dusky spot below it.

32. *Tomopteryx botulata*, Felder.

Tomopteryx botulata, Felder, Reise der Nov., Lep. v. pl. cxxxi. fig. 18.

No. 46. Should be the type of a different genus.

33. *Hoplosauris heliconoides*, Butler.

Hoplosauris heliconoides, Butler, Trans. Ent. Soc. 1882, p. 399. n. 87.

No. 118.


34. *Hoplosauris valeria*, sp. n.

♂. Primaries above greyish brown, traversed by numerous irregular darker lines; an irregular trifold pyramidal black spot, its base resting upon the inner margin near the base, its outer edge bordered with white; just beyond this two ill-defined blackish, angulated, parallel, sinuous stripes; central belt white internally, its outline represented by subconfluent black spots, the inner edge subangulated and sinuous, the outer edge running obliquely from costa to upper radial, where it is acutely angulated, from which point to inner margin it is regularly, deeply, but unequally bisinuated to inner margin; it is also bounded externally by a narrow whitish band intersected by a brown line; a sinuous white submarginal stripe, internally bounded and partly interrupted in the centre by four black spots, of which the first two are fusiform and larger than the others; a marginal series of numerous black dots: secondaries sericeous white, slightly brownish at apex. Body above grey-brown, the thorax dark;

below altogether paler than above; the markings almost obliterated. Expanse of wings 32 millim.

No. 53.

35. *Hoplosauris? edelmira*, sp. n.

♂. Bronzy greyish brown; primaries crossed by numerous irregular black lines; the central region darker from about the seventh to the tenth line, indicating a central belt, the outer edge of which commences in an irregular -shaped character, and is thence regularly undulated to inner margin; a small transverse elliptical white spot at end of cell; a regularly dentate-sinuate submarginal whitish line, immediately beyond which towards apex are two or three partly confluent black spots; a marginal series of numerous black dots: secondaries and under surface sericeous whitish; the primaries browner in certain lights and showing traces of the markings of the upper surface. Expanse of wings 40 millim.

Nos. 145 and 152.

36. *Epirrhoë Edmondsii*, Butler.

Fidonia Edmondsii, Butler, Trans. Ent. Soc. 1882, p. 385. n. 63.

No. 38.

37. *Epirrhoë decipiens*, Butler.

Coremia decipiens, Butler, Trans. Ent. Soc. 1882, p. 412. n. 109.

No. 22.

38. *Cidaria ceres*, Butler.

♀. *Cidaria ceres*, Butler, Trans. Ent. Soc. 1882, p. 417. n. 119.

2 ♂. Nos. 29 and 29 x.

The male differs from the female in its inferior size, the primaries either greenish or reddish towards outer margin, and with a submarginal band dentated or zigzag externally, either red-brown or slaty grey, and sometimes separated into contiguous spots.

39. *Cidaria corticalis*, Butler.

Anticlea corticalis, Butler, Trans. Ent. Soc. 1882, p. 411. n. 108.

No. 136.

I can hardly think this species rightly placed in *Cidaria*; it bears no resemblance to any other species referred to that genus by Mr. Warren.

40. *Cidaria misera*, Butler.*Cidaria misera*, Butler, Trans. Ent. Soc. 1882, p. 415. n. 117.

No. 154.

41. *Cidaria adela*, sp. n.

Sericeous greyish brown; the general aspect of *C. squalida* of New Zealand, but the primaries more acuminate at apex, the secondaries with irregularly dentated outer margin; the central belt of the primaries having more nearly the outline of *C. capitata* of Europe, but black-edged, crossed by black lines, and enclosing a black discocellular dot followed by a whitish nebula; beyond this belt one or two ill-defined crinkled transverse lines, followed by a series of black or blackish spots, bounded by submarginal white lunules; nervures on external area pale sandy brownish, interrupting an externally white-edged black undulated marginal line; fringe black-brown at base, white, tipped and spotted with blackish brown, externally: secondaries paler than primaries excepting towards outer margin; the external area being bounded internally by two or three scarcely discernible parallel lines slightly darker than the ground-colour; on the abdominal margin these lines terminate as blackish lunules; a short white dash at anal angle, being the last of a series of badly defined submarginal spots; marginal line and fringe as in primaries. Wings below with black oblique discocellular dashes or spots, one in each wing; an angulated zigzag blackish discal line and a whitish badly defined zigzag submarginal line; marginal line and fringe almost as above; costal area of primaries and whole of secondaries irrorated with whitish; tibiae and tarsi dark grey-brown, banded with whitish. Expanse of wings 37 millim.

Nos. 69 and 147.

42. *Euphia hymenata*, var., Felder.*Cidaria hymenata*, var., Felder, Reise der Nov., Lep. v. pl. cxxxii. fig. 41, ♀.

♂ ♀. Nos. 141 and 143.

The female in the present series is paler than in Felder's figure, the primaries being stramineous instead of deep ochreous. The male has shining pale copper-brown primaries varied with pale ochreous on basal area and just beyond the cell; the upper portion of the central belt is also of this colour; the latter is represented by two slightly divergent nearly straight grey stripes, the outer one of which is inter-

rupted just beyond the cell by a white 7-shaped character; the secondaries are sericeous, cream-coloured, acuminate at apex; the neuration is peculiar, the internal vein absent, the three median branches placed near the abdominal margin, and the lower discocellular veinlet absent; the subcostal branches spring from the end of the cell, not from a footstalk, as in the female.

I have followed Warren in calling this a species of *Euphia*, though the character of the male points rather to a relationship to *Remodes* and allied genera.

43. *Spargania pastoralis*, Butler.

Ypsipetes pastoralis, Butler, Trans. Ent. Soc. 1882, p. 403. n. 104.

No. 20.

44. *Spargania bellissima*, sp. n.

Sericeous; primaries pale argillaceous brown; an irregular black-brown basal band, bounded externally by a zigzag white line; central belt irregular, white, shaded with buff in the centre and at inner margin enclosing three large irregular black-brown patches, two costal and one crossing the median branches, also two small black markings on inner margin, connected with the latter on each side by a slender line; the central belt is of nearly equal width from the inner margin to the lower radial vein (vein 5), but from thence rapidly widens to costa, where it is of double the width; a large apical blackish patch, divided by an irregularly zigzag submarginal line; the latter interrupted below the black patch by an oblique patch of white and bounded internally by a broad diffused band of smoky brown; fringe pale argillaceous at base, white externally, traversed by a central grey line and regularly spotted with black: secondaries silvery grey, darkest at outer margin; a black dot at the end of the cell; fringe paler than on primaries, with smaller black spots: head and collar buff, varied with black; thorax whitish; abdomen buff, with blackish subdorsal dots in pairs. Under surface silvery greyish; primaries with faint indications of the upper surface markings: secondaries, when examined with a lens, white, speckled with grey, crossed beyond the middle by an arched dentate-sinuate blackish line, followed by an ill-defined grey band; a black dot at the end of the cell: body below brownish; palpi black, banded with white. Expanse of wings 27 millim.

No. 132.

I was not able to adopt one of Herr Ruschewegh's names for this very charming little moth.

45. *Psaliodes signata*, Butler.

Psaliodes signata, Butler, Trans. Ent. Soc. 1882, p. 418. n. 122.
No. 124.

46. *Psaliodes diana*, Butler.

Cidaria diana, Butler, Trans. Ent. Soc. 1832, p. 416. n. 118.
Nos. 32 and 472.

Var. *cynthia*, Butler.

Cidaria diana, var. *cynthia*, Butler, l. c.
No. 37.

47. *Eupithecia corralensis*, Butler.

Helastia corralensis, Butler, Trans. Ent. Soc. 1882, p. 403. n. 100.

♀. Unnumbered.

The female is considerably larger than the male, but quite like it in colouring and pattern.

BIBLIOGRAPHICAL NOTICE.

Elementary Palæontology for Geological Students. By HENRY WOODS, B.A., F.G.S. 8vo. 222 pages, with numerous cuts. University Press, Cambridge, 1893.

THE study of palæontology of course requires a knowledge of existing forms, as these are the outcome of the older creatures and have close relationship as well with them as one with another. The relics of extinct organisms, though distinct enough, as material consisting usually of silica or carbonate of lime, rarely correspond to all parts found in recent forms, and therefore, though supplying little enough to a Zoologist, are all that can be made useful by a Geologist, knowing their value as zoological indications, and competent to recognize the history of their embedment in deposits, the mineral changes they may have undergone, and any altered positions of the strata that contain them.

This little guide-book (one of the "Cambridge Natural-Science Manuals") confines itself to a succinct account of those fossil Invertebrata which are of most use to the Geologist; and the student is expected to have the opportunity of consulting a collection of fossils.

In the Introduction some short remarks are offered on the con-